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ABSTRACT

The rationale, development, and implementation of a reading program designed to teach disadvantaged children the skills prerequisite to learning to read are discussed in this paper. Of particular importance are skills in the recognition and manipulation of basic speech sounds, phonemes. The first of the program's three parts takes two and one-half months and consists of learning to recognize starting phonemes in words, recognizing letter shapes, and connecting the letter shapes with their phonemes. During the second part of the program, occupying approximately two or three weeks, children learn to blend phonemes into words, gaining practice in recognizing and manipulating phonemes in any position within a word. In the third part of the program, lasting through the remainder of the school year, children meet stringent mastery standards for reading with comprehension and learn new words by means of the techniques developed in the first two stages of instruction. When the program was used at two Chicago inner city schools, most of the students showed marked reading improvement. Discussion following presentation of the paper is included. (RL)

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Helping Disadvantaged Children Learn to Read by Teaching Them Phoneme Identification Skills

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Helping Disadvantaged Children Learn to Read by Teaching Them Phoneme Identification Skills

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Why do so many disadvantaged children have trouble learning to read?

In our view, a major reason why so many poor children have trouble learning to read is that they lack certain prerequisite skills which middle-class children typically possess. We believe further that these skills can be provided by instruction; and that when they are provided, the children in question learn basic reading on schedule.

Of particular importance are skills in the recognition and manipulation of basic speech sounds, or phonemes--for example, the ability to identify the common beginning and ending sounds in "bat" and "bit", or to understand that the sound "ee" after the sound "mm" makes the word "me". We shall present evidence below indicating that disadvantaged children are often seriously lacking in such skills, although not--as is sometimes supposed--in auditory discrimination ability as such. Readiness curricula, to be sure, often provide exercises with sounds, such as sound matching and sound identification. But when children are as lacking in skills of phoneme recognition and manipulation as we have found to be the case for large numbers of the disadvantaged, they are unable to perform such tasks and

hence are quite incapable of benefiting from the material intended to help them. The potential usefulness of customary readiness work on sounds already presupposes the very skills these children need to develop!

Consider what the lack of these skills means for learning to read. A child who cannot recognize a sound in different contexts--who does not comprehend, for example, that "mother" and "man" start with the same sound--is deprived of the possibility of making any use of the relationships between letters and sounds when faced with the task of turning print into the spoken language with which the child is already familiar. But without this possibility, little or no basis exists for transfer in learning to read. Each different word must then essentially be learned anew as a separate symbol--a task inordinately dependent on sheer rote memorization and made even harder by the interference that eventuates from the same letters continually recurring as parts of the stimulus patterns in different words. As the number of words increases and their distinguishability becomes ever less, such a situation must rapidly deteriorate for a child.

Some have at times written (e.g., Smith, 1973) as if knowledge of the relationships between letters and sounds were unimportant for learning to read, or even irrelevant. For a child who is incapable of recognizing sounds in words, knowledge of letter-sound relationships indeed will be useless. But for a child who is able to make use of it, such knowledge will inevitably make a great deal of difference as a source of transfer. This is the case despite the fact that letters and phonemes--including patterns of letters and phonemes--are far from showing complete correspondence in

written English. The existence of perfect predictability from letters to sounds is hardly the requirement in order for letters to provide useful information about sounds. Combining information about the usual sounds that letters stand for with information from the other sources a child has available--the child's repertoire of spoken English, contextual clues, and memory of previous encounters with a word--can time and again enable word recognition to occur when neither the letter-sound information nor the other sources of information would suffice alone.

The potential utility of a child's knowing letter-sound relationships also is not gainsaid by the fact, sometimes viewed as a matter of concern, that a child when "figuring out" a word may lose track of its meaning. That this can happen does not imply that the child would be better off paying no attention to sounds. Again, the child would then be left with practically no basis for transfer in learning. When the deciphering of words into letter-sound correspondences takes so much of a child's effort that attention to meaning suffers, additional practice at deciphering can be given until it goes more smoothly and the child becomes able to recognize the words more rapidly. As Chall (1967) has shown, even when comprehension seems to be the problem beginning readers are having, such difficulties can be overcome by helping them gain greater facility at the decoding process--not by having them put <u>less</u> emphasis on the deciphering of words.

Making use in this way of the information about sounds that a word's letters can give is not possible, however, unless the child possesses whatever skills are necessary for identifying the phonemes of which words are composed.

If poor children are lacking in these skills, it should not surprise us that they often have trouble learning to read. Is there evidence, then, for a deficiency in these skills on the part of low-income children? We turn to this matter next.

Poor children frequently lack phoneme identification skills.

We now have direct evidence that children from disadvantaged backgrounds, as distinct from middle-class children, tend to have considerable difficulty analyzing words into phonemes (Wallach, Wallach, Dozier, & Kaplan, 1976). Further, our research shows that it is the specific ability to recognize phonemes in words that these children lack, rather than--as has sometimes been thought (e.g., Deutsch, 1964; Plumer, 1970)--the ability to hear phoneme differences. If the latter kind of auditory discrimination were the problem, the instructional outlook might be less promising than in fact is the case.

Our subjects were 146 children who were soon to be entering first grade. Seventy-six of them were from six different kindergartens or day care centers serving low-income families; the other 70 were from five middle-class kindergartens.

The children were given two different kinds of tasks. The first kind--auditory discrimination--assessed whether a child could hear the difference between spoken words that differed only in the phonemes with which they began, and these were similar--such as "lake" versus "rake", "mail"

versus "nail", or "key" versus tea". The second kind of task--phoneme recognition--determined whether a child could correctly identify given phonemes at the start of a word--for example, whether the child would agree that "rake" and "rag" begin with /r/ but "lake" and "mail" do not.

For the auditory discrimination task, we used a procedure that has often been used before for this purpose (e.g., Templin, 1957; Goldman, Fristoe, & Woodcock, 1970) but with an additional control. The procedure is to show sets of pictures of things that have very similar names--for example, a lake and a rake--and to have the child try to point to one of the pictures when the tester, avoiding giving other possible cues, pronounces its name. A child who consistently points to the correct picture in a series of such choices must be able to hear the differences between the phonemes that differentiate the names.

In the usual procedure of this kind, however, a child might hear the names quite correctly, but still not be able to point to the correct pictures. This would be the case if, because of vocabulary limitations, the child didn't know which names went with which pictures. To avoid such a problem, we always told the children what the pictures were to be called, repeating the names if necessary, until the children could name each picture correctly without help. Of course, learning the correct names itself requires being able to hear the differences between names that are similar. That almost all the children needed very few, if any, repetitions of the names thus already was evidence that auditory discrimination gives little trouble.

But the critical question was whether the children, after learning what

the pictures were to be called, could point at the picture which the tester named. One of two pictures was to be pointed at in each of 16 different sets. Only three children out of the 146 failed to get at least 15 of the 16 correct--two from middle-class kindergartens and one from a low-income center. Our data, thus, seem to show quite clearly that neither middle-class nor poor children at the age when they start school tend to have much trouble hearing the difference between different, related phonemes.

The situation is strikingly different, however, for phoneme recognition. Almost all of the poor children had a great deal of trouble with phoneme recognition in a variety of different tasks, while most of the middle-class children could identify phonemes readily. The tasks were designed to be as easy as possible; immediate feedback was provided, and a few selected phonemes (/m/, /s/, and /r/) were worked on extensively one at a time.

In one kind of phoneme recognition task, the child was shown pairs of pictures (again we made sure the child could name them correctly), one of which did and the other of which did not have a name that began with a particular phoneme. The child was to say which picture had the name beginning with the phoneme in question. Before proceeding with the items for any given phoneme, the child listened to instances of words that begin with it. For example, in the case of /m/, the tester said, "Some words start with the sound /m/, like 'Ma' or 'mud' or 'me'." The child was shown a picture of a man and a picture of a house and asked whether "man" or "house" starts with /m/. If the child said "man", the child was told that was correct; while if the child said "house", the child was told, "No, 'man'

starts with /m/." Then the child was shown the next pair of pictures, a book and a mop, proceeding the same way; then a car and a mouse, and so on.

There were five such pairs of pictures for /m/, five for /s/, and five for /r/--thus, 15 items altogether. Sixty-five of the 70 middle-class children got 12 or more of these 15 correct, whereas this was the case for only nine of the 76 poor children. Forty-six of the 76 poor children got nine or less correct.

A second kind of phoneme recognition task was similar to the one just described, except that the child was provided with a third picture in each set and was told that the name of this third picture started with the phoneme at issue. This third picture thus could be used for matching. The results were essentially the same as without the third picture.

There was one further kind of phoneme recognition task. After preliminary training which was designed to make the task as clear as possible, the child was asked whether he or she could hear a particular phoneme in a series of spoken words, some beginning with this phoneme and others not containing it. The tester indicated whether the child was right or wrong, and whenever the child said he or she couldn't hear the phoneme in a word that did contain it, the tester repeated the word, emphasizing and elongating that phoneme. While this task was somewhat harder overall, the differences between the two social class groups were as striking as before. The task contained a total of 36 items; 62 of the 70 middle-class children got 25 or more of the 36 correct, while this was the case for only nine of the 76

poor children.

Most of the poor children, then, had a great deal of trouble with each of the three phoneme recognition tasks, while most of the middle-class children had very little difficulty with any of them. But the various phoneme recognition tasks just described are all relatively simple versions of the kinds of procedures used in those standard reading readiness curricula that are concerned with sounds. Our data thus indicate that very large numbers of poor children lack the necessary ability to recognize phonemes that is presupposed by these procedures. While virtually all children starting school (except those with actual sensory impairment) are able to hear phoneme differences, a great many poor children lack the competence at phoneme recognition that is needed in order to benefit from the instruction they receive.

Phoneme recognition is teachable.

The belief is widespread that the ability to recognize phonemes cannot be taught. According to the conventional wisdom, if a child is unable to perform the kinds of tasks with sounds that readiness curricula provide, then further maturation is necessary before the child will be in a position to acquire the needed skills. This belief often goes hand in hand with the proposal that reading instruction be deferred for the children in question "until their readiness matures." The consequence of waiting in this manner for readiness to mature is, of course, that these children--most often from low-income and frequently also from minority-group backgrounds--fall still

further behind in learning to read.

An alternative proposal that is sometimes recommended in light of the above belief is to teach reading without regard for letter-sound relationships, thus avoiding any need for competence at recognizing and dealing with phonemes. But we have already noted how difficult the task of learning to read becomes if a child cannot make use of the possibilities for transfer afforded by the relations between letters and sounds. This approach too, therefore, means that the children who lack phoneme identification skills will fall still further behind.

It seems, in fact, quite inevitable that children who lack the prerequisite skills involved in learning to read are going to fall further and further behind unless provision is made for them to acquire these skills. If children who cannot recognize phonemes can be taught to do so, such instruction clearly ought to be provided. Contrary to the conventional wisdom on the subject, it is apparent now that basic phoneme identification skills can be successfully taught. There is some evidence to this effect from research in the Soviet Union described by Elkonin (1971) and from research at the Universities of Wisconsin and Pittsburgh described by Gibson and Levin (1975). In the work that we have done along these lines (M. A. Wallach & L. Wallach, 1976; L. Wallach & M. A. Wallach, 1976), we have found it possible to spell out a systematic sequence of instructional procedures which reliably establishes phoneme recognition skills in first-graders who lack them. This sequence, administered by community tutors to a sample of low-readiness children in Chicago inner-city schools, resulted in every child's becoming able to

identify phonemes.

In the next section, we will give an overview of these instructional procedures and of the other aspects of the tutorial program which contains them. First, however, some background information should be provided on how we arrived at them and what influenced their development. Our first attempts at pilot tutoring involved tasks that were not too far removed from the methods to be found in some of the most systematic of the readiness curricula, such as Durrell and Murphy (1964) or Stern and Gould (1963), and that were, thus, similar to the phoneme recognition tasks in our experiment described in the previous section, which was actually performed after this tutoring. Working on one phoneme at a time, we would present the children with spoken words (often using pictures of what the words depicted as well), some of which did and others of which did not begin with the phoneme in question. The child was to indicate whether each word started with the phoneme at issue or not, and when errors were made they would be corrected. We rather quickly found, however--as the experiment which we did later also showed and as many teachers have known--that some children simply couldn't do this kind of task and that extended practice didn't result in their learning how to do it either, despite the best of indications regarding the child's motivation to perform and rapport with the tutor. If, instead of giving children the kind of series of words just described, we gave them two words at a time, one of which started with a given phoneme and the other of which did not, with the child to choose the word in each pair that started with the phoneme at issue, making correct choices became a little easier. But

again, for many children this task too was quite impossible to learn. Such children simply did not seem capable of recognizing the phoneme in the context of the word.

What these children appeared to need was some sort of a strategy they could apply to a word that would make the phoneme recognizable--something they could do with a word that would serve to extract the phoneme from its context. Having the child try to accentuate the initial phoneme in some way did not seem to help. We finally hit on an approach that did work, however--namely, getting the child to "break words up," to separate off the first sound from the remaining sounds by a pause. If a child can say "r - ake" and "p - ot", then it is not hard for the child to tell whether "rake" or "pot" starts with /r/. All of the children were able to learn to break up words in this manner, first in direct imitation of the tutor and later on their own. And once a child could isolate an initial phoneme in a word this way, the child no longer had any trouble recognizing it. Working with phonemes in other positions than at the start of a word came easily thereafter, and so too did learning to read--but that is a part of the story to come later.

Our procedure of separating off critical phonemes by pauses is not very different, it turns out, from one which Zhurova (1963) had earlier found some young children to use spontaneously for identifying the initial sound in a word--and which she also found was of help to others when she taught it to them. The child would repeat the initial sound several times before saying the word--e.g., "d - d - doggie," "b - b - bear". Essentially the same function is served: the critical phoneme is separated off and pronounced, as it were,

"by itself."

Of course, most consonant phonemes, such as /d/ and /b/, cannot really be pronounced by themselves; some sort of vowel sound, such as "uh", always ends up accompanying them. This seems, in fact, a major reason why there has not been more use of procedures like Zhurova's and ours--or indeed why there have been so few attempts to teach phoneme identification skills altogether. It is widely believed (e.g., Gleitman & Rozin, 1973; Gibson & Levin, 1975) that the extra vowel sounds that get added when words are overtly analyzed into their constituent phonemes, and deleted when the phonemes are "blended" to form the words, will inevitably confuse the child. We found this problem in fact, however, to be a relatively minor one and not hard to overcome. Perhaps the reason it turns out to be minor is that the added vowel can, after all, be a single, unemphasized sound that remains constant for various consonants, thus providing a common feature from which abstracting the consonant sound is relatively easy. In any case, most of the low-readiness children with whom we have worked show by their performance that they grasp fairly rapidly what the segmentation strategy that we want them to use is all about. They become quite proficient at breaking words up in this way, treating the additional vowel sound as irrelevant. Some children take longer to learn than others, but none have failed to catch on.

There were two further procedures for helping children learn to identify phonemes in words that we also included, although these seemed much less critical than isolating a phoneme by pronouncing it separately

from the rest of the word that contains it. One was to have the tutor say "tongue-twister" sentences in which the critical phoneme that the child was to learn to identify would keep recurring at the beginning of different words. In the case of /j/, for example, the sentence is: "John got juice and jelly on his jacket when Judy jumped on him." The relevant words in such sentences would then be broken up as described before, with first the tutor and then the child saying, "John, J - ohn, juice, j - uice," and so on. The other procedure was this. For a child who said that a word started with a given phoneme when it didn't, we thought that hearing what the word would sound like if it did start with that phoneme might also be of help. Thus, for example, if the child said that "telephone" started with /j/, the tutor would say "No. It's telephone, not jelephone."

But the most important by far of these procedures for learning phoneme identification skills seems to be having first the tutor, and then the child, break words up with the initial sound separated off by a pause and pronounced "by itself." Here was a strategy that children could use for disembedding a phoneme from its word context--and could learn, after sufficient imitation, to apply on their own.

These three procedures for acquiring phoneme identification skills were built into an explicit and systematically sequenced program aimed at beginning first-graders (L. Wallach & M. A. Wallach, 1976) that nonprofessionals could carry out as tutors with low-readiness children. All such children tutored by community adults with this program in our field research (see M. A. Wallach & L. Wallach, 1976) successfully learned

phoneme concepts and letter-phoneme associations to rigorous criteria of mastery for every letter of the alphabet. Ninety per cent of these low-readiness children, furthermore, did so in approximately two and one-half months on the basis of a half-hour tutoring session per school day. The remainder who took longer were children who had missed large numbers of tutoring sessions. Clearly, then, phoneme recognition can be taught, in a relatively short period of time, and to children whose low scores on readiness tests mean that they are expected to have a difficult time learning to read.

Are there practical means for providing help to the children who need it?

On the basis of such considerations as the foregoing, we have developed a practical instructional program that establishes phoneme identification skills and builds systematically from them to basic reading competence. The program can be successfully applied by community adults without educational credentials as tutors under appropriate supervision. It is designed to bring most low-readiness first-graders to mastery of basic reading within the first-grade year on the basis of a half-hour tutoring session each school day.

Three key attributes characterize our tutorial program: it makes sure that a child will learn phoneme recognition and manipulation skills and apply them in reading; it utilizes the principle of cumulative mastery throughout--always assuring prior mastery of any needed prerequisites and always

indicating what the tutor is to do in order to enable a child to master a step if that step is failed initially; and it is fully concrete and specific, so that successful application depends only on carrying out instructional routines that are spelled out in complete detail. An important means used for guaranteeing mastery of tasks in the program has been to build in as a requirement that the child apply what is learned already to the task at hand--rather than leaving such transfer up to the child. In this section, we shall first give an overview of the program's components (see L. Wallach & M. A. Wallach, 1976, for the complete program, and M. A. Wallach & L. Wallach, 1976, for a full description of its background and use), and then briefly review evidence that we have gathered testifying to its effectiveness under regular operating conditions in the field (see M. A. Wallach & L. Wallach, 1976, for a full presentation of this evidence).

In the first of the program's three parts, which takes about two and one-half months for low-readiness children, the child learns to recognize starting phonemes in words, to recognize letter shapes, and to connect the letter shapes with their phonemes. In the second part of the program, which takes about two or three weeks for low-readiness children, the child learns to blend phonemes to form words, gaining practice in the course of this at recognizing and manipulating phonemes in any position in a word. And in the third part, which runs for the rest of the academic year, the child meets stringent mastery criteria for reading with comprehension the regular classroom reading materials, learning whatever further words are needed by a process that assures utilization of prior knowledge of letter-

phoneme relationships and of blending.

Part I of the program teaches the most typical sound for each consonant letter and the short vowel sound for each vowel, proceeding in alphabetical order and using only lower-case letters at this point. Such choices as these were determined by the principle that the program be kept as simple to use as was consistent with the goal of delivering reading competence to any child. A sequence of 10 steps is followed for each letter in turn.

Step 1, "introduction to the sound," introduces the phoneme in question with a "tongue-twister" sentence containing many words that start with it. For example, in the case of the phoneme for "h", the sentence is, "Harry had a horrible headache and hated to hear Henry howl." The tutor has the child repeat after her each word that has /h/ as its starting sound in this sentence, first in the usual way and then with its starting sound separated off by a pause from the rest of the word.

Step 2, "the two-picture game," presents pairs of "game-pictures" to the child--line drawings depicting objects the names of which start with the phonemes for the various letters. Of the two game-pictures in each pair, the name of one starts with the phoneme at issue and the name of the other with any of a variety of possible phonemes. The child's task is to name the game-pictures and say which member of the pair starts with the phoneme being worked on, proceeding with successive pairs until the stringent criterion of seven correct choices in a row is met. If the child chooses the wrong picture--for example, selects "violin" instead of "window" as starting with /w/--the tutor follows a specific correction procedure, saying,

"No. It's violin, not wiolin." Then, pointing to the window picture, she says, "Window starts with /w/. Say 'w - indow.'" And the child repeats the word with its starting sound segregated off in this manner. If the child still finds the task too difficult, a further routine is added. After the child names the two pictures but before a choice is made, the tutor says the name of each picture with a pause between its starting sound and the rest of the word and has the child do likewise, only then permitting the child to choose.

Step 3, "the yes-no game," is harder than Step 2. Now game-pictures are presented one at a time. Half of them, in random order, have names starting with the critical phoneme and the other half, names starting with various other phonemes that in addition are different from the contrast phonemes used in Step 2. The child is to name each picture and say whether or not its name starts with the critical phoneme. While in Step 2 the child decides which of two instances better fits the phoneme at issue, in Step 3 the child carries out the more demanding task of considering the phoneme's boundaries and deciding whether each instance falls within them or not. Again the rigorous criterion of seven correct answers in a row must be met. If the child calls a false positive, the tutor's correction procedure indicates what the word would sound like if it did start with the critical phoneme; and if the child calls a false negative, the correction procedure lets the child hear the word with its starting sound segregated by a pause from the rest of the word. Again if the child has too much difficulty, further practice is given in breaking words up, as follows. After the child names a picture but before saying whether or not its name starts with the critical phoneme, first

the tutor and then the child repeat the name with a pause after its starting sound.

Step 4, "letter tracing," introduces the letter shape for the phoneme in question through an "alpha-picture"--a picture that contains the letter form as an integral part of its design and depicts an object whose name starts with the critical phoneme. In the case of "d", for example, the alpha-picture is a door. The round part of the "d" forms the doorknob and the straight part is worked into the door's edge. Such embedding of the letter provides a cue that helps the child recollect what sound the letter is for. The tutor has the child say the name the normal way, say it with its starting sound isolated by a pause from the rest of the word, and say the starting sound alone. Practice then follows in tracing the letter's form on dotted outlines of the letter, using a sheet that also contains the alpha-picture.

Step 5, "letter drawing," is similar to Step 4, but now the child practices forming the letter without dotted outlines for tracing but only horizontal guide lines on the practice sheet. Again the sheet also contains the alpha-picture. Both steps together are to aid in the discrimination of the letter shape and its association with the critical phoneme.

Step 6, "the picture-matching game with the letter-drawing sheets," presents a series of game-pictures to be matched with one of three alpha-pictures according to the starting sounds of the game-pictures' names. The phoneme being worked on is contrasted with two others so chosen to provide useful practice at discriminating similar letters and similar phonemes, as well as sufficient rehearsal of letter-phoneme linkages already learned by

the child. Various routines make sure the child knows what sounds the letters in the alpha-pictures represent, and, as each game-picture is presented for matching to an alpha-picture, what sound the game-picture's name starts with. Matching errors are followed by correction procedures. The learning criterion again is a rigorous one of seven errorless matchings in a row. Further help is added to simplify the task if at first the child has too much trouble. For example, if the child has difficulty giving the correct starting sounds for the names of the game-pictures, a routine is inserted that provides additional practice at separating off the name's starting phoneme from the rest of the word by a pause.

Steps 7, 8, and 9 are further games for matching sounds to letters. Each game again contrasts the phoneme and letter at issue with two other phonemes and their corresponding letters--different ones in the case of each game--and calls for learning to a criterion of seven correct matchings in a row. Step 7 still provides the added help of having the letters embedded in their alpha-pictures, while Steps 8 and 9 present the letters alone. In Steps 7 and 9, the tutor tells the child words from specified lists, with the child to give each word's starting sound and point to the appropriate letter. In Step 8, game-pictures are used again. The pool of spoken words and game-pictures for Steps 6 through 9 is large enough to preclude the child's learning these tasks by sheer rote memorization of what is to be done with individual game-pictures or words. As on Step 6, specific routines are followed for insuring correction of any of the possible kinds of errors that can occur and for simplifying the task if at first it is too hard.

Step 10, "giving the sounds for the letters," is the capstone of the sequence of steps for each letter and a continual review of all letters worked on already. All letters worked on thus far are presented singly, in scrambled sequence, with the child to give the letter's phoneme and a word that starts with it. Further practice is provided if necessary. Then the child returns to Step 1 for the next letter.

After all 10 steps have been gone through for the last letter, "z", the child begins Part II of the program. In this part, the child blends phonemes into words and reads short, regularly spelled words by sounding them out. In the process, the child gains facility at moving from phonemes to letters and back again at different positions in a word. Unlike the steps in Part I, which are gone through for each letter in turn, here each step is completed for various sets of words before moving on to the next step. There are three steps in all.

Step 1, "the which-picture game," uses various triads of game-pictures. The three pictures in each set all have short names starting with the same phoneme. For example, the first set is ball, bed, and bus. The tutor says the name of one of the pictures sound by sound, and the child is to guess which picture it is. If the child has trouble, the tutor provides help by means of a graded series of routines that supply increasingly more of the needed blending and end if necessary with the word spoken normally. Then the tutor begins with separate sounds again for another picture in the set. This procedure continues until the child meets the criterion of correctly identifying all three pictures in the set from hearing their separate sounds

alone. Then work begins on the next triad of game-pictures. After criterion is reached on the seventh such triad, the child moves on to Step 2. Since the members of a given triad share the same starting phoneme, the child in making his or her identifications is forced to consider later phonemes in the word and the relations between these phonemes as spoken separately and as blended.

Step 2, "building and reading the names of some game-pictures," again uses triads of game-pictures, but also uses "letter-cards"--cards with lower-case letters on them--for all the letters needed to make the names of the three pictures in each set. For example, the first set of game-pictures is hat, map, and yam, and the letter-cards for "h", "a", "t", "m", "p", and "y", are shuffled and presented as well. Placing one of the pictures before the child, the tutor has the child name it. The tutor, after repeating the name, then says it sound by sound. The child now tries to build the name by finding and assembling in sequence the letter-cards for the appropriate sounds, with help from the tutor as needed. Then the tutor, while pointing to the letters in sequence, has the child say the appropriate sound for each. After that, the tutor moves her finger progressively faster across the letters, saying the sounds more and more blended together until she says the word normally and then has the child say it normally too. This routine is carried out with each of the three pictures in the set. Next, the tutor builds the name of one of the pictures in the set and has the child try to read it, giving help in sounding out and blending if necessary. This procedure is repeated with each of the three names, in varying orders, until

the child meets the criterion of reading each name correctly without help. Finally, the child builds the names, receiving help if still needed. After completing these tasks for one triad of game-pictures, they all are repeated with the next. Step 2 comprises five triads in all. The names are consonant-vowel-consonant combinations in every case, the members of any triad have the same vowel, and all spelling conforms to the letter-phoneme linkages taught in Part I. From Step 2 the child starts comprehending how a word's letters correspond in their visual sequence to the temporal sequence of phonemes in the word as spoken.

Step 3, "building and reading some more simple words," is similar to Step 2 but uses 22 new triads of words. Now only letter-cards are involved--the words are just spoken instead of being the names of game-pictures. When first introduced, the tutor uses each word in context. The words are analogous in form to those of Step 2, but the words within each set are closely similar. For instance, the first set of words is "pan," "man," and "fan". To emphasize letter-sound correspondences, letter-cards that remain the same from one word to the next in a set are left in place and only the changing ones moved. For example, only the "p" and "m" are switched when working on "man" after working on "pan". As before, the child meets the criterion of reading each word in a set correctly without help after the tutor builds it from letter-cards.

After the prescribed tasks have been completed with the last of the 22 triads of words used in Step 3, the child proceeds to Part III of the program. In this part, the tutor works with the classroom reading materials, first

teaching separately each page's new words according to explicit routines that assure transfer from what was learned in Parts I and II of the program. The tutor prepares a word-card for each vocabulary entry, noting the page on which it first occurs in the reader. Words are printed twice on the card--all letters in lower-case and again with the first letter capitalized (except for words always capitalized, such as names, which are printed only that way). The tutor has the child read the word-cards, going through them in the order of the words' first appearance in the reader. Part III is begun with that story in which the child's cumulative total of missed words reaches three.

For each page of a story, the tutor has the child read the word-cards for all words whose first occurrence is on that page. If a word is read incorrectly, the tutor moves into an explicit four-step routine for teaching words, stopping it at any point before the end if the child gets the word right. In Step a, if the word is composed of simpler words (e.g., "something"), these are shown to the child and the remaining routines followed with each simpler constituent first. In Step b, the tutor gives the sound for any letters whose sound differs from the letter-sound correspondences already learned. In Step c, the tutor, pointing to the letters in sequence, has the child give each letter's sound. A chart of the alpha-pictures can be looked at if the child needs a reminder of the sound that was learned for a letter. Where letters have sounds that differ from what was learned before, the tutor again gives the sound and then has the child repeat it. In Step d, if the child still can't read the word, the tutor sounds it out

while pointing to the letters in sequence. If that doesn't result in the child's getting the word, the tutor then blends the first sounds together while pointing to the appropriate letters (e.g., for "father," "fa")--if necessary blends further into the word (e.g., "fath")--and so on, until, if necessary, giving the entire word.

The tutor goes through the word-cards for all new words on a page, following the above four-step routine for a word whenever needed and shuffling the cards after each run-through, until the child meets the criterion of reading all words correctly twice in a row without any help. Then reading of the page ensues, with the four-step routine for teaching words used for any words that the child can't get. The tutor discusses the story's meaning as the page is read, and if the child seems not to understand something, it is read again and discussed further. After the page has been read with understanding, the words that were missed are gone over the way the word-cards were before--to the same criterion of getting all words correct twice in a row without help. Then all word-cards for that page are gone through again to that same criterion. If the child in reading the page missed more than two words or read with difficulty, this whole cycle of reading the page, work on missed words, and work on word-cards, is repeated until the child meets the criterion of reading the page smoothly and missing no more than two words.

This procedure now repeats for the next page--once again starting with word-cards for all new words on the page, then reading of the page, etc. After all of a story's pages have been gone through with this procedure, further review procedures follow. The entire process repeats for a given

story until the child satisfies the criterion of missing no more than seven different words in the story and reading it smoothly. Then work begins on the first page of the next story. Additional review procedures also are included. In all of this, the four-step routine for teaching words is used wherever needed, and stringent mastery criteria must be met for moving from page to page and story to story.

With our tutorial program now outlined, we turn next to the question of its effectiveness. The Metropolitan Readiness Tests (Hildreth, Griffiths, & McGauvran, 1966, 1969) were administered to 268 children (mostly first-graders, with a few "slow-learner" second-graders added) at two predominantly Black inner-city public schools on Chicago's South Side at the start of the school year. Those 98 children scoring within the bottom 40 per cent on national norms for beginning first-graders defined the target group of "low academic-readiness" children for the research--children likely not to learn to read in first grade. Their median fell at the 25th percentile of the national norms. A random subset of these children, spread across eight classrooms in proportion to the incidence of low-readiness children in those classrooms, were tutored with the program by community adults--Black mothers. The tutors were hired on the basis of no requirements other than reliability, working well with children, patience, and, of course, literacy. Selection and treatment of children and tutors were carried out in ways typical of what could be expected to occur in the program's normal operation.

Looking first at evidence internal to the tutorial program, 86 per cent of the low-readiness children who were tutored showed a high level of reading

competence before the end of the school year. They were reading on the order of 20 pages every five tutoring sessions or better in standard first-grade texts whose vocabularies started at about 80-100 words and kept rising. Indeed, 69 per cent of the tutored children had been reading at this rate for two months or more before the year ended. One should keep in mind that this rate of progress was displayed despite the very high mastery criteria imposed for moving forward in the texts. The other 14 per cent of the tutored children were progressing too, but at slower rates.

What about comparisons between experimentals and controls? Recall that the children from the low-readiness target group found in each of the eight classrooms of the study were randomly assigned to tutored and control conditions on a proportionate basis reflecting their numbers in each classroom. Any teacher differences thus were taken into account. An extensive battery of tests was administered to the target children after an average of about 30 weeks of tutoring--somewhat before the end of the academic year. If anything, the test comparisons are conservative since they pertain to less than the full amount of tutoring that the school year can accommodate. The testing was conducted on an individual basis by an examiner blind to whether children had been tutored or not. The spectrum of tests administered was intended to provide a representative assessment of what basic reading competence concerns--the reading of sentences and passages with understanding as well as the reading of words.

Some of the tests used were developed by us and drew on the vocabulary entries in the classroom texts; others were standardized tests of reading

achievement that had been formulated independently of the classroom texts. The tests that we devised dealt with word recognition and sentence reading. The word recognition list and the series of sentences in these tests drew upon increasingly difficult classroom text vocabulary as they progressed. And while the sentences made use of vocabulary entries from the classroom texts, the sentences themselves were, insofar as possible, constructed so as to be new to the children. To pass the items on the sentence reading test, comprehension questions had to be successfully answered.

The standardized tests of reading achievement used were from Spache's Diagnostic Reading Scales (Spache, 1963a, 1963b, 1963c, 1972a, 1972b, 1972c). Again, both word recognition and the reading of unfamiliar prose with understanding of its meaning were assessed. This time, the materials had no connection at all to the classroom texts. Spache's Word Recognition lists contain words graduated in difficulty. Spache's Reading Passages, also sequenced for increasing difficulty, require that the reading of a passage meet or exceed certain standards in regard both to reading facility and quality of comprehension in order for the child to pass to the next harder passage in the series.

Turning now to the results of these evaluations, consider first the findings on the tests that we developed. Because of the manner in which our word recognition list was constructed, we were able to estimate, on the basis of the children's scores, the absolute numbers of words they could read. According to these estimates, the median child in the experimental group could recognize about 150 words; the median child in the control group, a bit

over 50. Regarding our sentence reading test, with its increasingly difficult sentences as the series progresses, the maximum possible score was 25 comprehension questions answered correctly. For the median child in the experimental group, the score was 19.5 of those comprehension questions correct, while the score for the median child in the control group was less than half that. Large numbers of the experimentals read and comprehended even the harder of the sentences, while large numbers of the controls showed little comprehension at all.

Moving on to Spache's tests, the median child in the experimental group read 26 words correctly on the Word Recognition lists devised by Spache, while the median child in the control group read eight or nine. Applying Spache's grade level norms for performance on the lists, the proportions of the experimentals and controls performing near grade level or better at the word recognition task were about two-thirds and one-third, respectively. Spache's Reading Passages, in turn, gave results indicating that half of the experimental group, but only about one-sixth of the control group, performed near grade level or better. Recall that comprehension as well as reading facility had to be demonstrated for credit on this test.

We should add that the various effects described in these comparisons of experimentals and controls were found to be quite consistent across tutors and schools. The effects were highly significant statistically, of course--but more to the point, were sufficiently large in their magnitudes to be important in practical terms. Children low in academic readiness at the start of the school year tended not to learn to read by the following Spring with conventional

instruction; but showed substantial reading competence by that time if tutored by nonprofessionals with our program under conditions that approximated what its normal intended usage would be like.

As a final point in regard to evaluating our program's effectiveness, note that work similar to ours in all respects except for the instructional program used was carried out by Ellson, Harris, and Barber (1968). In that work, community adults once again tutored first-grade children for a half-hour each school day through the school year. Some of the tutors used procedures developed by Ellson and his associates that involved reading whole words in prose material from the beginning; others used procedures adapted by an experienced reading specialist from the classroom activities. No matter which of these kinds of tutoring was used, little difference was found between tutored and untutored children on standardized tests of reading achievement. That, by contrast, children tutored with our program showed marked gains on tests of this kind thus does not seem likely to be a result of tutoring as such but rather of tutoring with the specific content of our program.

In closing, certain general observations seem in order. While the point of departure for our program has been the problems disadvantaged children experience in learning to read, its applicability is by no means limited to poor children. The program also should be of help to middle-class children who have reading difficulties--especially if, as is often the case, these difficulties include trouble with phonemes.

The type of skill analysis exemplified by our work has been a highly <u>empirical</u> enterprise; not, as sometimes is done, merely the a priori devising

of a logical-seeming task sequence. Thus, we had no idea how difficult phoneme identification could be for some children until we observed them trying to grapple with what we thought would be simple tasks, and failing again and again to perform them correctly. Our emphasis on training phoneme identification skills is a direct outgrowth of these observations, and of our observations of the children's success after training was introduced. As another example, our belief in the importance of carefully establishing knowledge of letter-sound regularities was based on our observing that children often do not induce these regularities spontaneously. It was supported further by our finding that exceptions to such regularities did not seem to pose much difficulty for children; rather, knowing the regularities seemed to make the exceptions distinctive and hence recognizable as such. The need is for extensive pilot development aimed at empirically identifying whatever trouble spots may occur in a child's learning and building in ways of successfully coping with them.

As we see it, those with a cognitive outlook on education, in their zeal to counteract the stimulus-response views so recently ascendant in that field, are now overemphasizing the importance of children learning things "on their own"--by discovery. To be sure, those interpreting education in cognitive terms have made significant contributions in pointing out that children <u>are</u> constantly picking up information spontaneously, and that instruction will not help if a child does not see the relevance of what the instruction concerns. These points do not imply, however, that information--or, for that matter, strategies of processing information--cannot also be provided by instruction,

or that learning is not real unless arrived at by spontaneous induction. One should not lose sight of what it is possible for instruction to accomplish, as when, for example, Gibson and Levin (1975) note repeated evidence of children's failures to make discoveries of regularities by themselves, but in their opposition to a stimulus-response viewpoint fail to draw what would seem the obvious implication that instruction would be useful here.

There is no need to let a stimulus-response outlook pre-empt the topic of instruction. What one child is in a position to discover spontaneously, another child can be taught. And if a child does not know letter-sound regularities or how to identify phonemes when the child is expected to learn to read, then instruction in these matters is called for. Again, if a child cannot see how to use or apply something in further learning, we need not wait for spontaneous discovery to occur but can provide instruction in whatever will bring the child to such an understanding. Thus, for example, we found that children who knew letter-sound regularities but could not decipher words needed instruction in how to utilize for this purpose the knowledge they already possessed. When they were taught a transfer strategy for applying their knowledge of letter-sound regularities to the task of figuring out words, this task became feasible for them. Reliance on spontaneous discovery inevitably means that children who are lacking necessary skills will fall further and further behind. Rather than eschewing instruction in favor of spontaneous discovery, then, it is time for instruction to be taken much more seriously than it ever has before.

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June 8--A.M.

OPEN DISCUSSION OF WALLACH PRESENTATION

WILLIAMS: I was interested in your use of adults from the community as your tutors. You mentioned that one criterion for selecting them was literacy. I wonder if you would tell us a little about your teacher-training, if any, and what you mean by tutoring? Did you have any problems with some people not being able to take on a tutoring assignment?

WALLACH: No, we had no such problems. What we did was ask the principals of the schools for referrals of community mothers. We took all comers the principals provided us with. I believe there are various ways in which such people can be recruited. This is just one of a number of possibilities. The training essentially consisted of three weeks of role-playing work before the academic year began. Most of the role-playing work was carried out with a pair of tutors themselves alternately playing tutor and child, with some of the role-playing with a trainer, my wife. Beyond the initial three weeks, what the tutors needed was about a one or two-hour period weekly of supervision. Of course, this was what's needed to get tutors going from scratch. Once they know the program, they can continue using it, and they also can train other tutors to do the work. Many of the tutors, I believe, can undertake the training of new tutors.

In fact, we had an example of that in the course of the year's field research.

ROSNER: What was happening to your control group while your children were getting their daily tutorial session?

WALLACH: They were taught by the same teacher, in the classroom.

ROSNER: In other words, they went to the same classroom as your experimental kids, but they just never met with the tutor?

WALLACH: That's right.

ROSNER: So there was no alternative treatment for them?

WALLACH: There was not in this particular field study. I don't know if you are familiar with the work that Ellson has done at Indiana, but Ellson has done extensive tutoring research, which in its logistical form is comparable to what we did; that is, once again community adults are recruited who don't have particular educational credentials, the tutoring goes through the first grade year, and the most effective of the tutoring he did was a half an hour duration per school day. At best, that tutoring yielded only modest gains. The only difference between that tutoring and our approach was in the specific program materials. Anyway, that provides one control basis.

ROSNER: How can you deal with the argument that says, well, these were tutors, they weren't trained teachers, but meantime, they were using a good standardized and well accepted instructional approach. They were teaching kids a rather well developed set of principles. The point is, then, why can't we just make the argument that we don't need all of that preliminary stuff, all we need is a good phonics program?

WALLACH: Well, the answer to that has to do with other research, which suggests that you can't provide the kinds of skills that are needed for these children, without some of the sorts of tasks that one has been talking about here, such as

in particular phoneme identification types of tasks, and cumulative mastery types of activities. In other words, we are talking about kids who are relatively low to start with.

ROSNER: I am not ignoring any of that, I am just saying that I think you could probably find people who could make a very good case for the fact that if you introduced those children to a well-designed, highly structured phonics-based reading program, they wouldn't have needed any of that preliminary phonemic segmentation activity, and your study is in support of that.

WALLACH: The problem is a lot of kids we are talking about would still be left behind if one began where that kind of work would start out from.

POPP: I wondered if the mere fact that you could eventually get to a task where they were isolating phonemes, doesn't suggest that the task itself is the problem. The kind of language that we use in asking them if these words begin with the same sound isn't what's been going on in many homes. It is the communicative skills which are at issue.

WALLACH: I am not saying the first study demonstrates that they are not capable of doing this, but they haven't learned to do this, isolating of initial phonemes from their word context. And we tried in various ways to assess that kind of ability, making the task as easy as possible in this experiment that I was talking about at the beginning. Regardless of the method by which one tried to approach it, and making it as easy as possible, identifying initial phonemes in the context of words as heard was something that these children to a striking degree could not do.

And, incidentally, in that work I am talking about disadvantaged kids from diversified cultural backgrounds. They were black, white, they were from urban areas, they were from Appalachia, they were quite varied. The thing they had in common was a striking inability to do that.

GUTHRIE: I think the project is commendable in many ways. I think the question of what inferences you want to make about instruction is really an important one that we should try to grapple with. An instruction... program like yours is complex, multi-faceted. Now, what kind of inferences about instruction can be made by the application of that kind of a system to kids? I don't think that you can necessarily say that phoneme analysis is demonstrated to be necessary, by y... evidence, because you don't have the critical contrast on that factor.

WALLACH: That's why I keep citing the Ellson work. I draw on that very heavily in conceptualizing what these effects are like.

GUTHRIE: I think that's indirect evidence. On the other hand, I don't think that it would be possible to partition your instructional system into all of the necessary pieces to get a full and total documentation for each important piece. I am not sure that's a very sensible thing to do. But I would be interested in what you think, conservatively, about the inferences for instruction, that can be made f... this.

WALLACH: Well, conservatively, the two major claims that I think one wants to make about what is important instructionally here are phoneme identification skills and cumulative mastery. That is, the building in of transfer strategies that makes sure that prior learning is utilized in subsequent learning. And a

heavy emphasis on phoneme identification skills at the outset.

GUTHRIE: Would you submit that hypothesis to a test with (1) your curriculum as you described it, and (2) another curriculum that begins with letter presentation and the blending that went along with letters, and it left off the first part. Give equal time to the two groups of children, one getting the preliminaries and one getting everything that starts with letters, and everything that comes after, and you are going to give equal time with your same tutor, matched groups of kids?

WALLACH: Very good. Do it. I would love you to do that.

GUTHRIE: Is that an important contrast for your argument?

WALLACH: Yes, of course one would like to see all of that done. Here is a practical program that works. We have a set of theoretical notions about why it works.

ROSNER: I want to direct Dr. Guthrie's attention to a 1971 study which we published, which did this.

GUTHRIE: Well, I was just trying to drive the question home about how one evaluates instruction, rather as a conceptual enterprise, rather than one particular piece of information. I am concerned with the problem of how we accumulate instructional knowledge. I am familiar with your study.

SUPPES: Well, Mike, I think to pursue John Guthrie's line of questioning, for

example, it would be very useful to have the detailed data of what happened during the year, for example, how many trials did the students get. In 30 minutes, what are we thinking of, on the order of 100 responses, or so, to questions and problems?

WALLACH: Yes.

SUPPES: So we are talking about, say, for 150 days, say they are absent 30 days, about 15,000 trials.

It would be very interesting to me to see what happened during that long history. It's not satisfactory in thinking about instructional programs, to simply see the evaluation data at the end of the year. I mean, one would like to be able to analyze what happened during this period.

Undoubtedly a great virtue of your program is this extremely careful organization for mastery and the training of the tutors for that mastery. What would interest me enormously is something much more radical than Jerry and John are mentioning, for example, a whole word method organized in the same particular way.

WALLACH: That is essentially what Ellson has done.

SUPPES: I see some head-shaking here.

POPP: It does not include the phoneme identification at any point of the program. Your inference is that it comes in the beginning, I think the difference in Ellson's, if you really wanted to compare it to yours, would be a

different order in the hierarchy, perhaps.

SUPPES: What seems to me is really the crucial variable in these programs, is not the evaluation at the end of the year, what we want is detailed information through the course of the year. As soon as we are getting 15,000 to 20,000 trials, to put it in standard experiment terms, we want to ask what the devil is happening during those 20,000 trials? You talk about transfer, and we know how to study transfer with 20,000 trials, we know a lot better than talking about a gross evaluation at the end of the year. And I would like to see that detailed information for different programs, so one can get a much closer feel as to where the differences are.

WALLACH: I think that certainly would be good to do. I feel that a first order of business is this kind of evaluation that you are decrying, though.

SUPPES: I am not saying to do that, I am asking for more, not less.

WALLACH: A stress on "Are these kids able to read with comprehension at the end of the year?" It would be very useful to do. We have some of that information reported in the book. One other point I think is important, is that no child failed to learn. The difference was that some children were learning faster than others, and on the average--

SUPPES: That is too enthusiastic. I mean, as an old beat-up person from the schools, I just can't play those games. I want to know if you can do that with 30,000 kids in Chicago. I will bet you any odds you can't do that. I mean, that is just too enthusiastic a claim, from an experimental standpoint.

WALLACH: I didn't say all kids learned to read. I only said 86% of those kids did that. What I insisted on a minute ago was that no kid failed to make progress. Some children may, for various reasons, proceed more slowly than others, but even the worst of them will be chugging along.

Recess